



Dry Contact Sensor DCS15 User Manual



Help Version updated till firmware 404i / SP456
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Introduction / What is a Dry Contact Sensor

The Dry Contact sensor is a simple connection to burglar alarms, fire alarms or any application that requires monitoring by the unit. Dry contact sensors are user definable and can be used to detect many different inputs such as UPS status, security systems, air conditioning status.

These general purpose switches can be either input or output. When used as an output it can sink up to 20 mAs. You can select the output voltage by setting the Output Level to a Low or a High. When set to Low, the pin will output 0 volts. When set as a High, the pin will output 5 volts.

When used as an input a switch will retain any error condition until it is read via SNMP. Therefore, if a switch encounters a critical condition at any time, it must report that condition before it can return to a normal state.

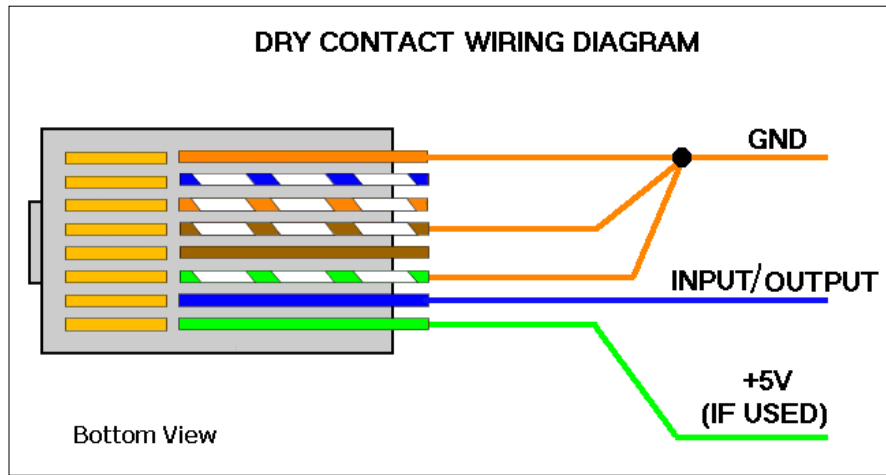
Input pins can be used to detect whether or not an input switch is open or closed. In combination with external sensors, input pins can detect whether a door or window is open or closed, if there is a water incursion and many other conditions.

The input pins work by sensing the presence of a voltage level on an input pin. When the switch is open, the voltage is different than when the switch is closed.

To test a dry contact input, wire ground to one side of the switch. Ground is always pin 8 on the connector. Wire the other side of the switch to the switch sensor. Set the Normal State field to Open. Set the Direction field to Input. When the switch closes, the input pin will be shorted to ground and the switch will change state from normal to critical

Specifications & Features:

- Measurement Indication - Alarm or Normal
- Communications cable - RJ-45 jack to sensor using UTP Cat 5 wire.
- Sensor type - open/closed contact switch
- Power source: powered by the unit. No additional power needed.
- The unit auto detects the presence of the Voltage Sensor
- Measurement rate - multiple readings every second
- Full Autosense including disconnect alarm
- Dry contact sensor OID is: 1.3.6.1.4.1.3854.1.2.2.1.18.1.3.X



Dry Contact Pin Assignments

Pin 1 -- color = Green -- function = Is +5 Volts and is the power source pin (does not have a pull up resistor)

Pin 2 -- color = Blue -- Function = Is the Input/Output pin to the base unit. Maximum voltage is 5Volts, maximum sink current is 20mA. Has internal pull up resistor of 4.7k ohms

Pin3 -- color = White/Green -- Function = This is an input pin and used for checking the sensor type.

Pin4 -- color = Brown -- Function = This is an input pin and used for checking the sensor type.

Pin5 -- color = White/Brown -- Function = This is an input pin and used for checking the sensor type.

Pin6 -- color = White Orange -- Function = This is an input pin and used for checking the sensor type.

Pin7 -- color = White/Blue -- Function = This pins is used for the digital input and output of our analog sensors (Airflow, Digital Voltmeter and 4-20mA Converter sensors).

Pin8 -- color = Orange -- Function = Ground

Dry Contact connection FAQ

Question #1: Why do you connect the Gnd to the +5 on the "black wire" for the RJ45 cable?

Answer: The +5V is the input pin to the sensorProbe unit and is used for checking the sensor type, we have pull up resistor inside sensorProbe units.

Question #2: How do you use the above diagram to determine how I connect the dry contact sensor to a simple switch?

Answer: We use pin 1 (green wire) and pin 8 (orange wire) for connecting to the power source and GND of the switch. Pin 2 and 7 are for connecting the input/outputs. The other pins are used for checking the sensor type.

Question #3: Do I connect one side of my switch to the "Gnd" and the other to the "Input/Output"?

Answer: Yes. Just like the diagram above.

Question #4: What is the function of the green wire (+5V)?

Answer: The Green wire is +5V source connection and this is used when the sensor requires a power source.

Question #5. Can I control the Dry Contact Sensor via SNMP?

Answer: Yes, you can use the following SNMP commands:

```
SNMPset -m all -v1 -c <community> <IPAddress> .1.3.6.1.4.1.3854.1.2.2.1.18.1.25.<port> i  
<mode>
```

When <community> is admin password <IPAddress> is IP address of the unit <port> is the Port of power relay (default start with 0)

<mode> is mode to control
allow-sensor-control(1),
cycle-On-Off-On(8),
cycle-Off-On-Off(7),
turn-on(3),
turn-off(4)

Configuring the Dry Contact Sensor

a) Plug the sensor into one of the RJ45 ports on the rear panel of the unit.

b) Now point your browser to the IP address of the unit (default, 192.168.0.100). Next you need to login as the administrator using your administrator password (default is "public"). You will then be taken to the summary page.

c) From the summary page you need to select the sensors tab. The layout of the next page will vary depending on your unit so please refer to your units manual.

d) You should now be able to setup the thresholds for your sensor. The low critical, low warnings, normal, high warnings, high critical values can be set from this page.

Now we will cover the settings that are specific to your sensor.

Direction: The Switch Direction can be either **Input** or **Output**. When set as an Input, the sensor will report its status as either **Normal** or **Critical**. The status is Normal if the Normal State field matches the current value applied to the sensor. For example, if the Normal State field is High and the input to the sensor is high then the status is Normal. The input voltage should be limited to 0 to 5 volts in order to protect the sensor.

If the Direction of the sensor is Output, the sensor can be used to drive external equipment.

Description of Status When Normal: This field is the custom description, which will be displayed in the Status field when the dry contact sensor is Normal. Examples for this field are: Door Open, Pump Turned On, Light Turned On, etc

Description of Status When Critical: This field is the custom description, which will be displayed in the Status field when the dry contact sensor is Critical. Examples for this field are: Door Closed, Pump Turned Off, Light Turned Off, etc

Output Level: The Switch Output Level field can be either **High/+5 Volts** or **Low/GND**. When set to a High, the output value of 5 volts will be applied to the switch. When set to a Low, the Output Level field will depend upon the value of Direction. If Direction is set to Output and the Output Level field is set to low, the Switch will source current in order to maintain 0 Volts. If Direction is set to Input and the Output Level field is set to low, the Switch will become tri-state.

The Output level of High will pull-up the switch even if the Direction is set to Input. However, when the Switch Direction is set to Input and Output level is set to high the Switch will output a weak pull-up current. This output can be overridden by shorting the pin to ground. In this way, an external switch can be determined to be open or closed.

Normal State: The Switch Normal State field can be either **Open/+5 Volts** or **Closed/GND**. When set to a +5 Volts, the input value of 5 volts will cause the Status to be reported as normal. When set to +5 Volts, the input value of 0 volts will cause the Status to be reported as Critical Low. When the Switch Normal State is set to a Low, the input value of 5 volts will cause the Status to be reported as Critical High, and the input value of 0 volts will cause the Status to be reported as normal.

OID: The dry contact is a switch-type sensor such as water sensor, motion sensor, AC Voltage Detector, relay, and siren & strobe light. The OID is sensorProbeSwitchStatus = 1.3.6.1.4.1.3854.1.2.2.1.18.1.3.X



Information on Dry contact cables: The extension length of the dry contact twisted pairs is limited only by the amount of electromagnetic noise in the area. So the lengths can be quite long, but long cable lengths may create occasional false positives. These false positives can be eliminated with the advanced filtering of the dry contact sensor on the system. You can define how long a sensor must be in the error condition before changing state from Normal to Critical. You can also define how long the sensor must remain in the Normal state before changing from Critical to Normal.

(continued on next page)

Dry Contact Sensor Setup (input)

It is normal for the dry contacts to be detected as the security sensor, as it is the same type of sensor when they are first connected to your sensorProbe unit.

What you have to do on the sensorProbe is click on the "Dry Contacts & Drivers" and enable the dry contact port as shown below:



Summary	Sensors	Traps	Mail	Network
Sensor Settings				
Please select a Dry contact Sensor to configure				
Environmental				
Temperature				
Humidity				
Water Detector				
Airflow Sensor				
Contacts & Drivers				
Dry Contacts & Drivers (1)				
4-20 mAmp				
Dry Contacts (3 - 12)				
Power				
AC Voltage Detector				
DC Voltage Sensor				
Relay				
Security Sensor				
Security				
Motion Detector				
Alarm Security				
Siren & Strobe Light				
Settings				
Autosense				

Sensor Settings	
Please select a Dry contact Sensor to configure	
Sensor Description	
Dry Contact Switch1 Description	
Dry Contact Switch2 Description (2)	

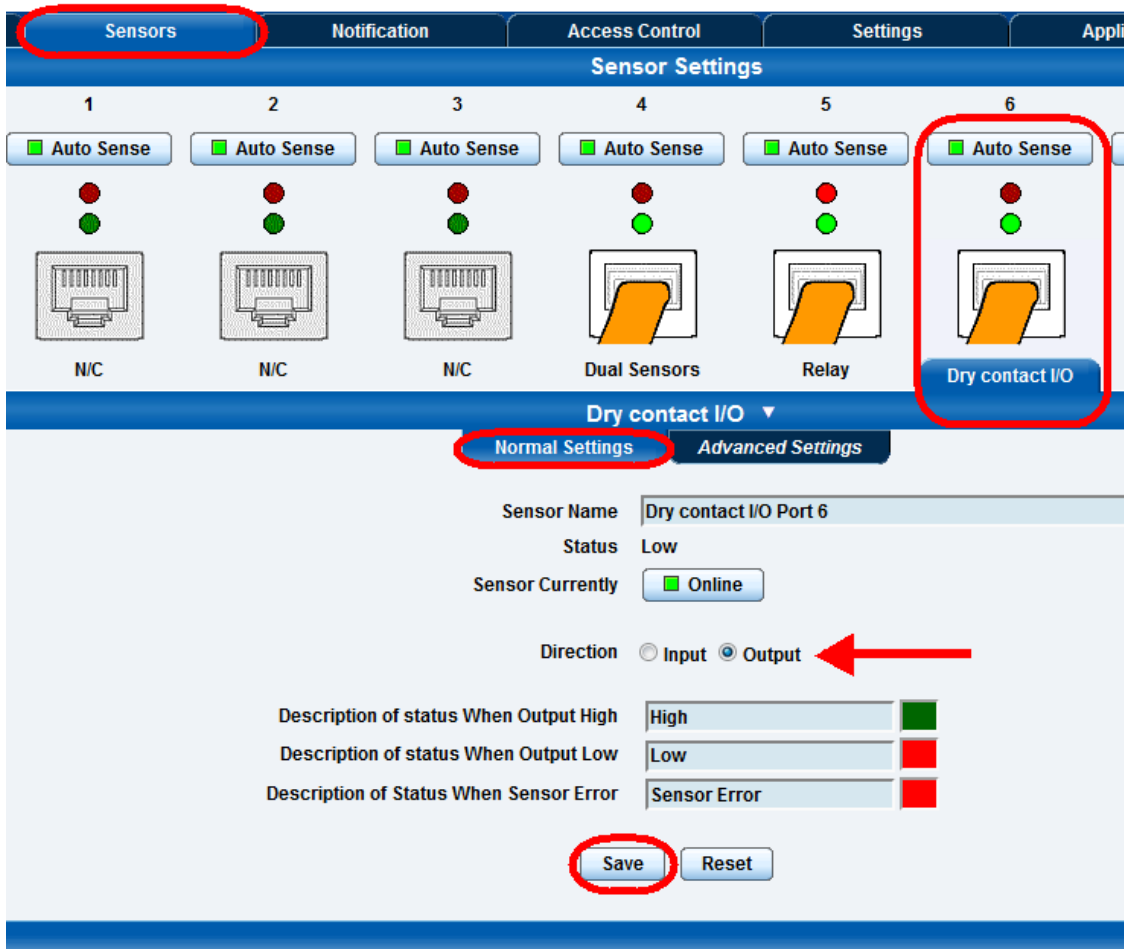


Summary	Sensors	Traps	Mail	Network	System
Sensor Settings					
Dry Contact Sensor Settings					
Port 2					
Description Dry Contact Switch2 Description					
Status Critical					
Sensor Online/Offline Online					
Description of Status When Dry Contact Normal Normal					
Description of Status When Dry Contact Critical Critical					
Go Online/Offline Online (2)					
Direction Input					
Normal State Open/+5 Volts (2)					
Output Level High/+5 Volts					
Save Reset					
Sensor Controlled Relay Sensor Controlled Siren (2) Sensor Status Filters					

Summary Sensors Traps Mail Network System					
Auto refresh (sec.) 0 Start Online Status of Sensors					
Port	Type	Description	Reading	Status	Action
1	-	-	-	-	-
2	Dry contact	Dry Contact Switch2 Description	-	Normal	-
Sys Log (95 messages)					
1	26/02/10 11:40:04 Dry contact sensor on RJ45#2 status is now Normal				
2	26/02/10 11:40:01 Dry contact sensor on RJ45#2 status is now Critical				
3	26/02/10 11:39:48 Dry contact sensor on RJ45#2 status is now Normal				
4	26/02/10 11:39:47 Dry contact sensor on RJ45#2 status is now Critical				
5	26/02/10 11:37:52 Dry contact sensor on RJ45#2 status is now Critical				

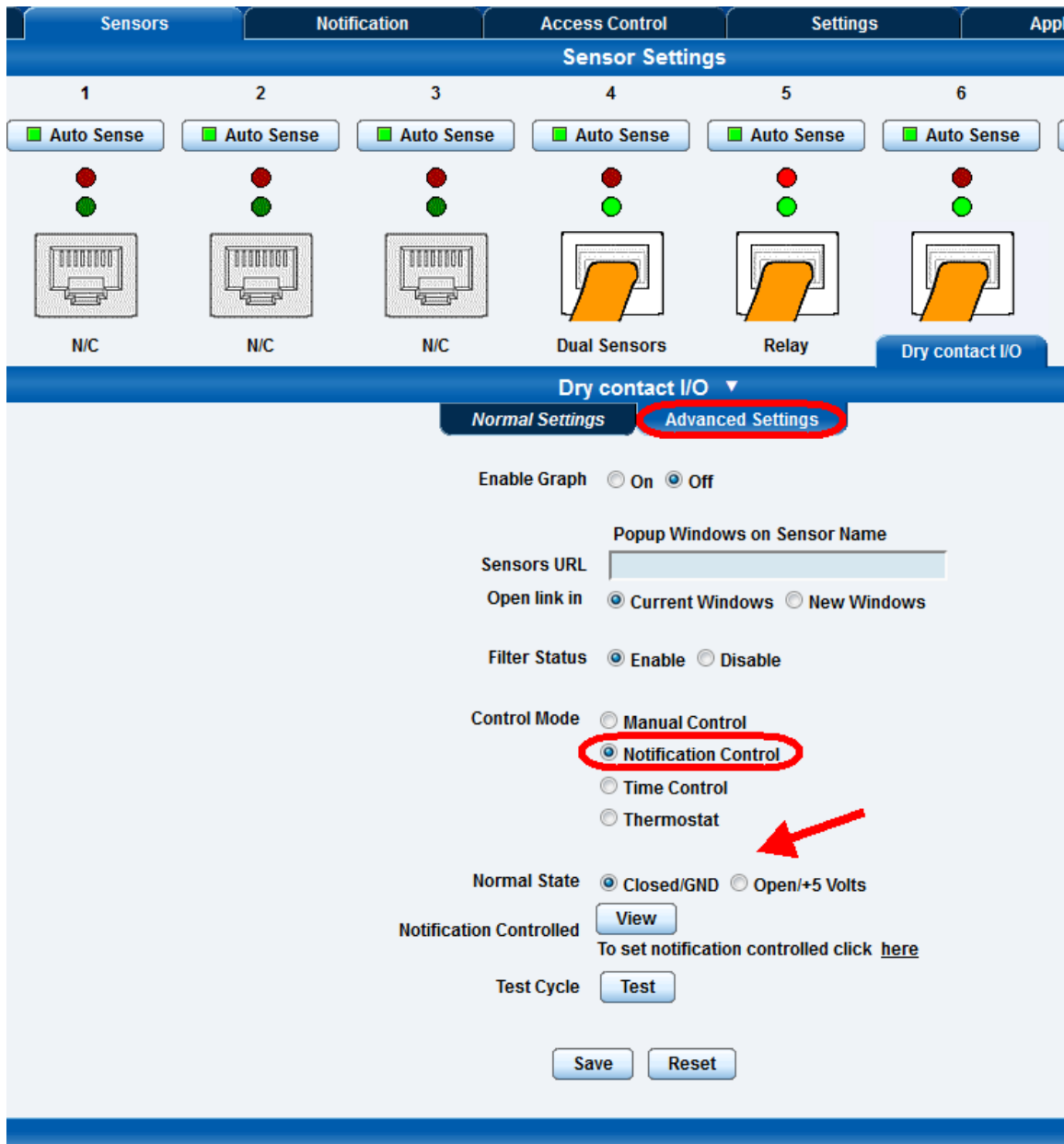
Dry Contact Sensor Relay Setup (output on securityProbe)

First you need to connect the dry contact sensor and the temperature sensor to the RJ-45 sensor port on your main base unit or your E-sensor8 expansion module.



The screenshot shows the 'Sensors' tab in the AKCP web interface. Under 'Sensor Settings', there are six ports. Port 6 is highlighted with a red box and labeled 'Dry contact I/O'. Below this, the 'Dry contact I/O' settings are shown. The 'Normal Settings' tab is selected. The 'Sensor Name' is 'Dry contact I/O Port 6'. The 'Status' is 'Low'. The 'Sensor Currently' is 'Online'. The 'Direction' is set to 'Output' (indicated by a red arrow). The 'Description of status When Output High' is 'High' (green box). The 'Description of status When Output Low' is 'Low' (red box). The 'Description of Status When Sensor Error' is 'Sensor Error' (red box). The 'Save' button is circled in red.

Next you need to be logged in as an Administrator, then navigate to the Sensors page then click on the Dry Contact I/O sensor port. In the Normal Settings tab as shown above you can now rename your sensor, you need to change the Direction to Output and you can also rename your Status descriptions or even change the color of the descriptions, then click the Save button.



The screenshot shows the 'Sensors' tab in the AKCP web interface. Under 'Sensor Settings', there are six sensors. Sensors 1, 2, and 3 are labeled 'N/C'. Sensors 4 and 5 are labeled 'Dual Sensors' and 'Relay' respectively. Sensor 6 is labeled 'Dry contact I/O'. Below the sensor settings, the 'Dry contact I/O' section is expanded, showing the 'Advanced Settings' tab. The 'Control Mode' is set to 'Notification Control', which is circled in red. The 'Normal State' is set to 'Closed/GND'. A red arrow points to the 'Normal State' section. The 'Save' and 'Reset' buttons are at the bottom.

Sensors **Notification** **Access Control** **Settings** **App**

Sensor Settings

1 2 3 4 5 6

☒ Auto Sense ☒ Auto Sense ☒ Auto Sense ☒ Auto Sense ☒ Auto Sense ☒ Auto Sense

N/C N/C N/C Dual Sensors Relay Dry contact I/O

Dry contact I/O ▼

Normal Settings **Advanced Settings**

Enable Graph ☐ On ☒ Off

Popup Windows on Sensor Name

Sensors URL

Open link in ☒ Current Windows ☐ New Windows

Filter Status ☒ Enable ☐ Disable

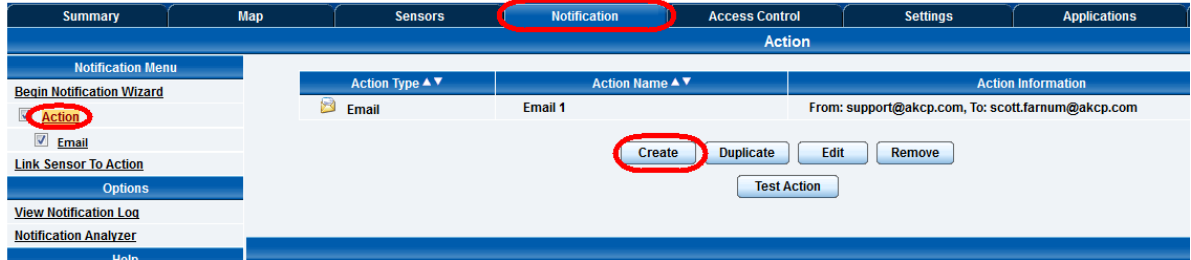
Control Mode ☐ Manual Control ☒ Notification Control ☐ Time Control ☐ Thermostat

Normal State ☒ Closed/GND ☐ Open/+5 Volts

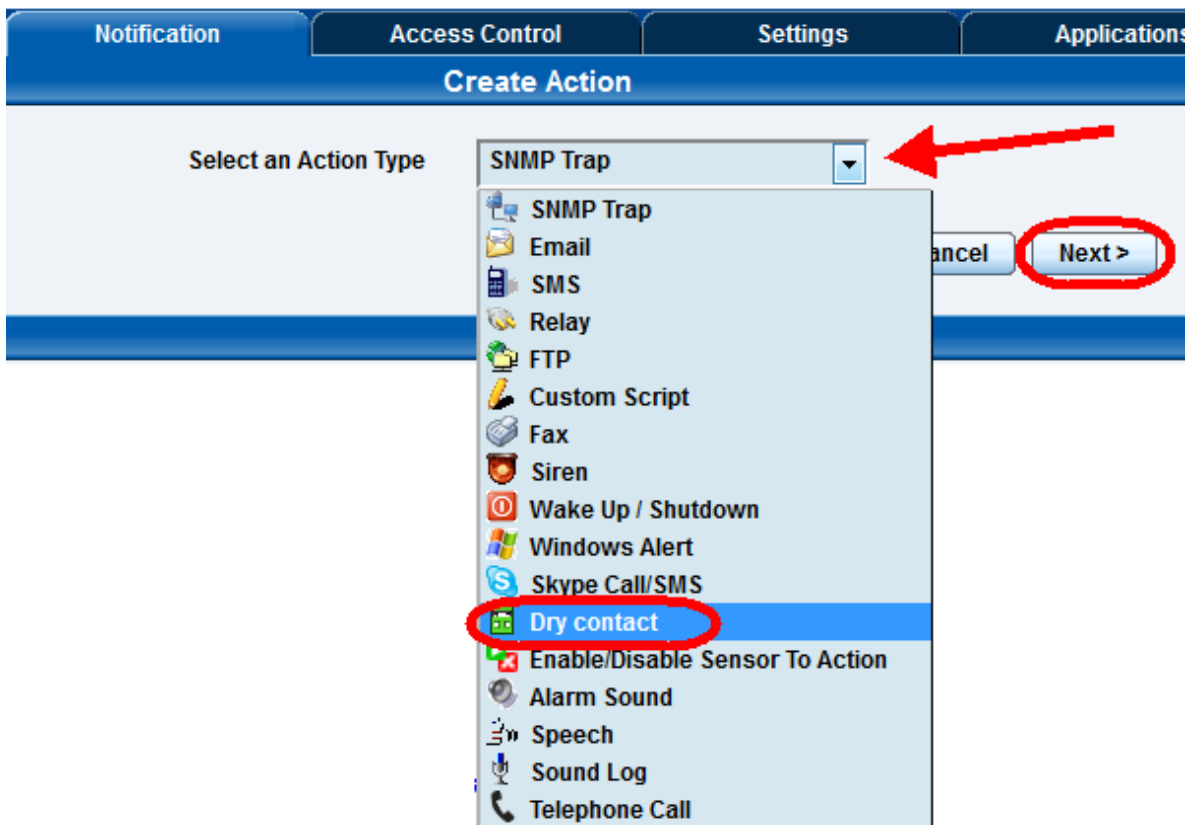
Notification Controlled To set notification controlled click [here](#)

Test Cycle

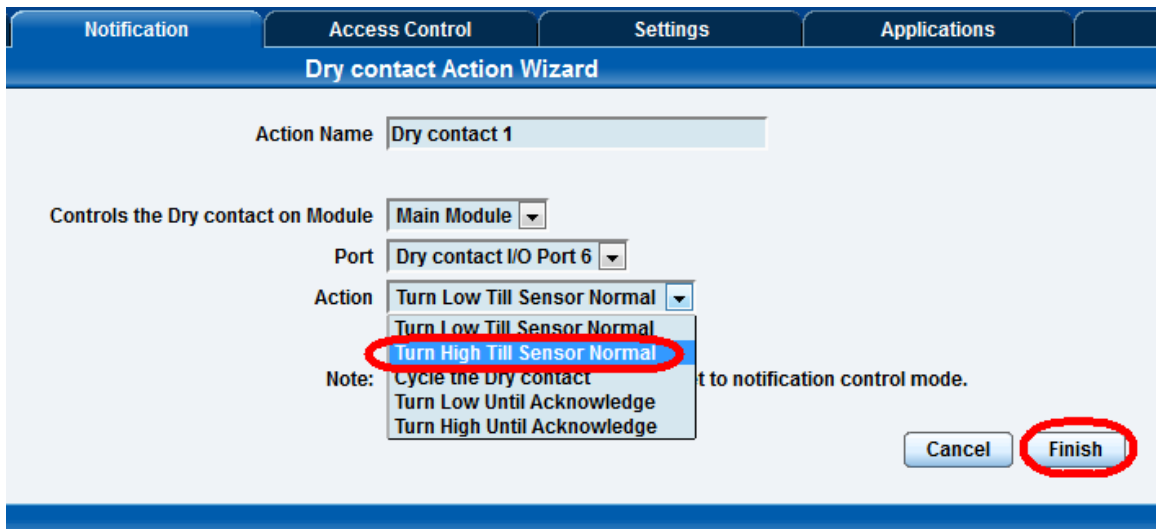
Since you are going to have our temperature sensor control your dry contact sensor relay you need to change the "Control Mode" to Notification Control as shown above. You also need to set the normal state of the sensor, whether it will be normally Closed (on) or normally Open (off). These settings need to then be saved by clicking on the "Save" button.



Now that the dry contact sensor is setup we now need to setup our Dry Contact Action so you need to first navigate to the Notification page, then go to the Action page and click on the “Create” button as shown in the screen shot above.



This will launch the Create Action Wizard. You will then click on the down arrow and choose the “Dry Contact” action from the drop down menu displayed, then clicking on the “Next” button as shown in the screen shot above.



Notification Access Control Settings Applications

Dry contact Action Wizard

Action Name

Controls the Dry contact on Module

Port

Action

Note: Cycle the Dry contact t to notification control mode.

Cancel Finish

In the next screen of the wizard you can name your action as you wish, you need to select the sensor that was previously setup from the Port drop down menu and then choose what action the output relay will take when triggered by the temperature sensor. You will then click on the “Finish” button to complete the action wizard.

Sensors

Notification

Access Control

Settings

Applications

Action

Action Type ▲▼	Action Name ▲▼	Action Information
 Email	Email 1	From: support@akcp.com, To: scott.farnum@akcp.com
 Dry contact	Dry contact 1	Dry contact I/O Port 6: Turn High Till Sensor Normal

Create

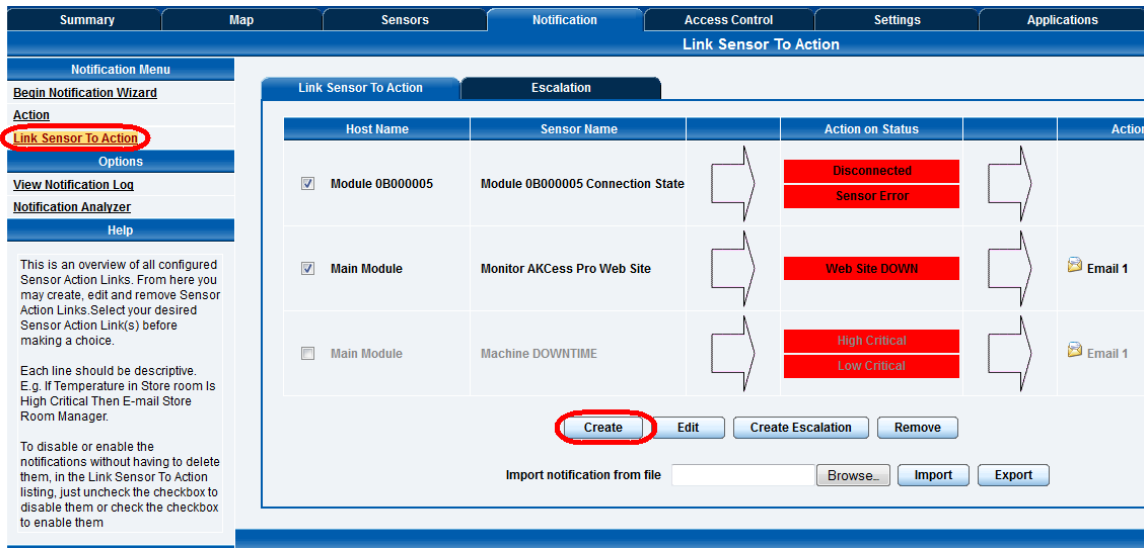
Duplicate

Edit

Remove

Test Action

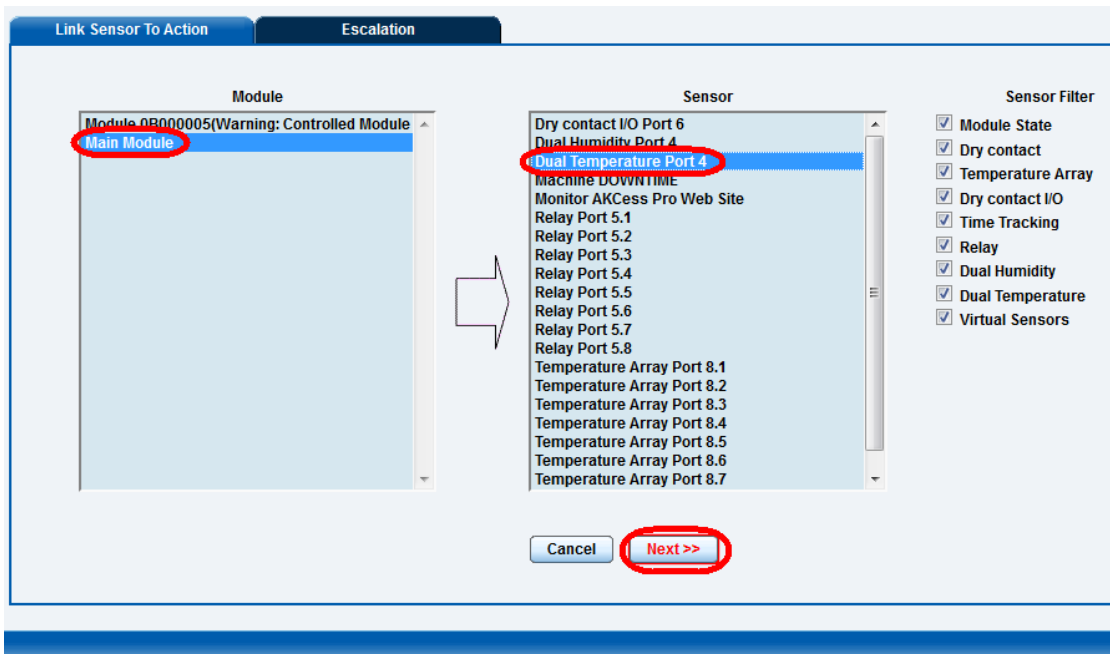
Now we see in the screen shot above that our new Dry Contact Action has been created and is displayed in our Action listing.



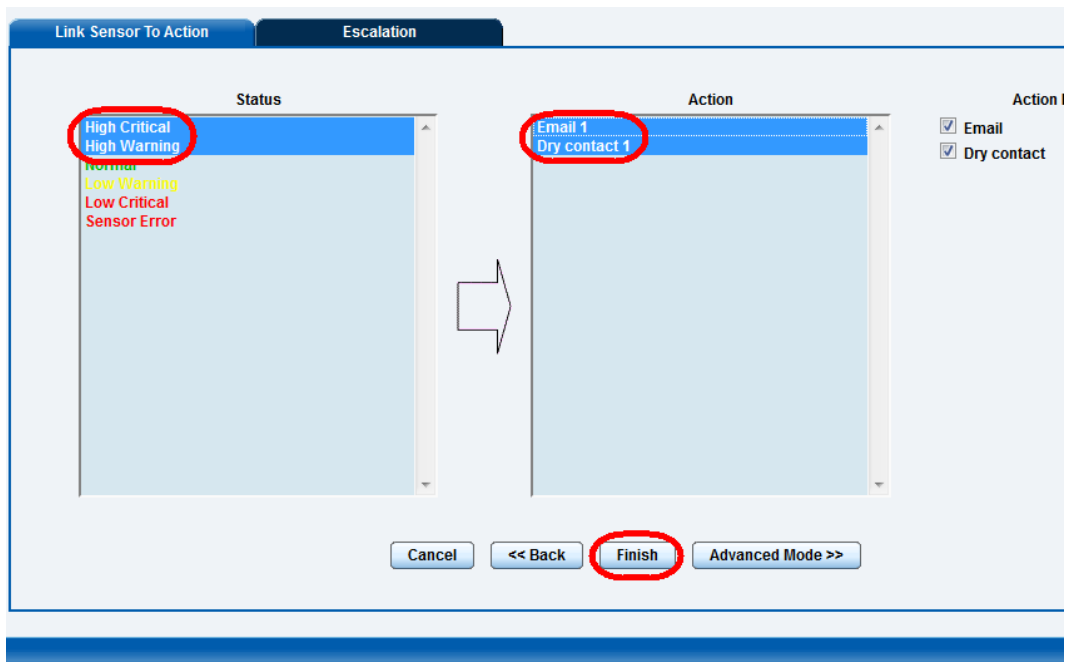
Now that our dry contact sensor has been setup and our dry contact action has also been setup we will now link our temperature sensor to our output relay (dry contact sensor).

Note: Keep in mind you can substitute the temperature sensor with any other AKCP sensor for example a water sensor, smoke sensor, AC or DC voltage sensor to control the dry contact relay output.

We first will click on the Link Sensor To Action then click on the “Create” button which will launch the Link Sensor To Action Wizard as shown in the screen shot above.



In the first screen of the wizard we will first highlight where our temperature sensor is connected in the Module field then highlight our temperature sensor in the Sensor field and click on the “Next” button as shown in the screen shot above.



The next screen in the wizard we will highlight the status or threshold that we want the relay to turn on or off in the “Status” field shown above. In the Action field we will highlight the action or actions we want the sensor to trigger. You can choose multiple actions by holding down the Ctrl key. In our example above we also have highlighted an email alert that was previously setup on the unit. (see the email notification manual for setting up an email alert on the unit).

When clicking on the “Finish” button the Link Sensor To Action Wizard will be completed.

Link Sensor To Action		Escalation	
Host Name	Sensor Name	Action on Status	Action Name
☒ Module 0B000005	Module 0B000005 Connection State	Disconnected Sensor Error	
☒ Main Module	Monitor AKCess Pro Web Site	Web Site DOWN	Email 1
☐ Main Module	Machine DOWNTIME	High Critical Low Critical	Email 1
☒ Main Module	Dual Temperature Port 4	High Critical High Warning	Email 1 Dry contact 1

Import notification from file

And finally we can see our temperature sensor and its status is now linked up with both our Email alert and our Dry Contact Sensor setup as a Relay output.

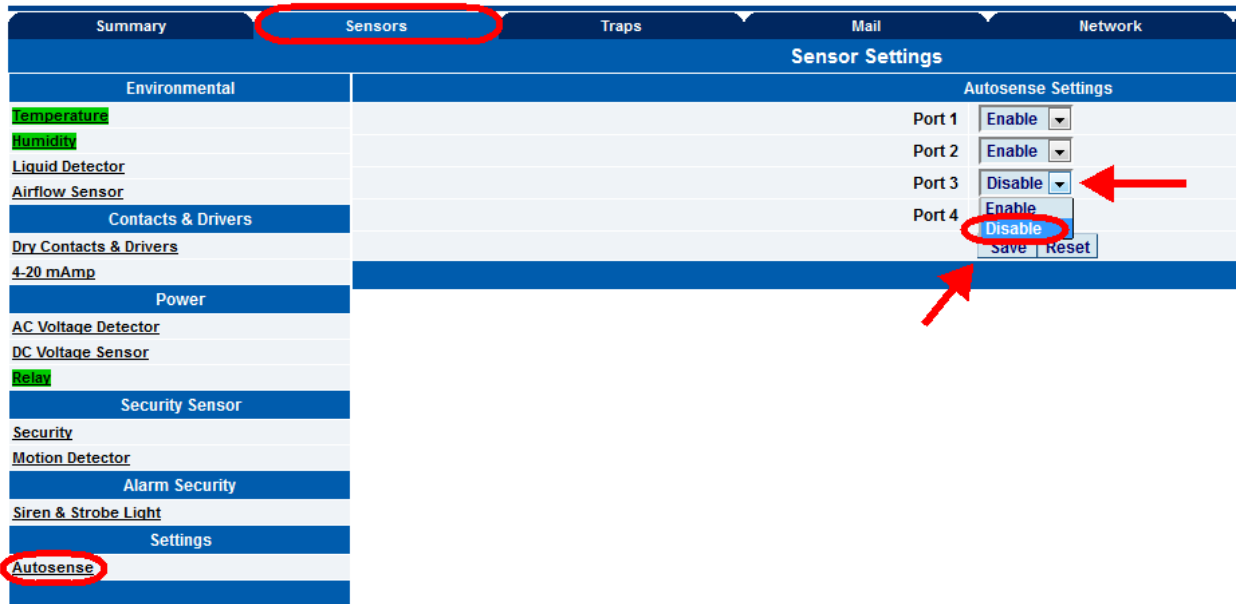
Sensors	Notification	Access Control	Settings	Applications	Help
Sensor Information					
Host Name ▲	Type ▲▼	Sensor Name ▲▼	Reading ▲▼	Status ▲▼	
Main Module	Dry contact I/O	Dry contact I/O Port 6	-	High	
	Dual Humidity	Dual Humidity Port 4	61 %	Normal	
	Dual Temperature	Dual Temperature Port 4	31.5 °C	High Warning	
	Relay	Relay Port 5.1	-	Sensor Error	
	Relay	Relay Port 5.2	-	Sensor Error	
	Relay	Relay Port 5.3	-	Sensor Error	
	Relay	Relay Port 5.4	-	Sensor Error	
	Relay	Relay Port 5.5	-	Sensor Error	
	Relay	Relay Port 5.6	-	Sensor Error	
	Relay	Relay Port 5.7	-	Sensor Error	
	Relay	Relay Port 5.8	-	Sensor Error	
	Temperature Array	Temperature Array Port 8.1	26.0 °C	Normal	
	Temperature Array	Temperature Array Port 8.2	27.0 °C	Normal	
	Temperature Array	Temperature Array Port 8.3	26.0 °C	Normal	
	Temperature Array	Temperature Array Port 8.4	27.5 °C	Normal	
	Temperature Array	Temperature Array Port 8.5	26.5 °C	Normal	
	Temperature Array	Temperature Array Port 8.6	26.5 °C	Normal	
	Temperature Array	Temperature Array Port 8.7	26.5 °C	Normal	
	Time Tracking	Machine DOWNTIME	0 Hours	Machine ON	
	Virtual Sensors	Monitor AKCess Pro Web Site	-	Web Site UP	
	Virtual Sensors	Virtual Sensors Port 1	-	Normal	
Module 0B000005	Module	Module 0B000005	-	Disconnected	
Sensors status will be reloaded in 03 secs					
System Log (221 messages)					
1	2012/06/18 21:25:02	Email ok: Good mail sent to scott.farnum@akcp.com			
2	2012/06/18 21:24:59	Dry contact I/O Port 6 status is High			
3	2012/06/18 21:24:58	Dual Temperature Port 4 is 27.5 °C, status is High Warning			

In the screen shot above we can see that when our temperature sensor reaches the High Warning our Dry Contact Sensor Relay is automatically triggered into the High status.

Dry Contact Sensor Relay Setup (output on sensorProbe)

In the sensorProbe's web interface you can set your thresholds, so that if you had a temperature alert then the unit will send an email, an SNMP trap and also control the dry contact (dry contact sensor) setup as an output relay on another port. You can have it turn on the relay, turn it off, or cycle it.

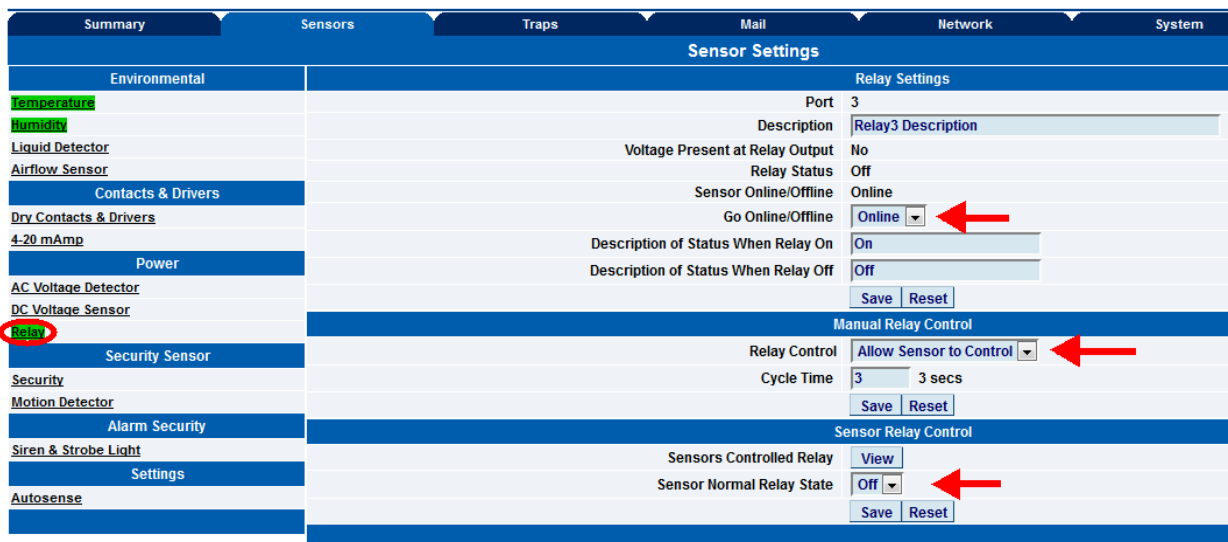
Note: If the screen shots appear too small, just use the view in your pdf reader to zoom in. The following screen shots represent a sensorProbe4 web interface. If your unit is the older SP2 or SP8 with the mega128 memory then your screen may appear differently.



The screenshot shows the 'Sensors' tab selected in the top navigation bar. The left sidebar contains a list of sensor categories: Environmental (Temperature, Humidity, Liquid Detector, Airflow Sensor), Contacts & Drivers (Dry Contacts & Drivers, 4-20 mAmp), Power (AC Voltage Detector, DC Voltage Sensor, Relay), Security Sensor (Security, Motion Detector), Alarm Security (Siren & Strobe Light), Settings, and Autosense. The 'Autosense' category is circled in red. The main content area shows 'Sensor Settings' for Port 4. The 'Autosense Settings' section has a dropdown menu for Port 4 set to 'Disable', which is also circled in red. A red arrow points to the 'Disable' option. Below the dropdown are 'Save' and 'Reset' buttons.

The first thing you need to do is connect your DCS15 (dry contact sensor) and your temperature sensor to your sensorProbe units sensor ports. The DCS15 will be auto sensed as the dry contact sensor along with the temp sensor.

So the next thing you need to do is log in to your sensorProbes web interface as the Administrator then navigate to the Autosense setting for the sensor port that you connected the DCS15 to and Disable the Autosense on this port as shown in the screen shot above.



The screenshot shows the 'Relay' category selected in the left sidebar, which is circled in red. The main content area shows 'Relay Settings' for Port 3. The 'Relay Settings' section includes fields for Description, Voltage Present at Relay Output, Relay Status, Sensor Online/Offline, Go Online/Offline, Description of Status When Relay On, and Description of Status When Relay Off. The 'Go Online/Offline' dropdown is set to 'Online' and is circled in red. Below this are 'Save' and 'Reset' buttons. The 'Manual Relay Control' section includes a 'Relay Control' dropdown set to 'Allow Sensor to Control' (circled in red) and a 'Cycle Time' field set to '3' seconds. The 'Sensor Relay Control' section includes a 'Sensors Controlled Relay' button and a 'Sensor Normal Relay State' dropdown set to 'Off' (circled in red). Below these are 'Save' and 'Reset' buttons.

You then navigate to the Relay settings for the port you have the DCS15 sensor connected to and turn the relay Online. You can also rename your relay, rename your Status Descriptions. You need to make sure the Control is set to Allow Sensor to Control, then you also need to set the Normal condition of the relay either on or off. In other words do you want the temp sensor to turn on something or turn off something? This needs to be saved in the web interface.

Sensor Settings
Temperature (Temperature2 Description) on Port 2

Port: 2
Description: Temperature2 Description
Current Reading: 75 °F
Status: Normal
Sensor Online/Offline: Online
Go Online/Offline: Online
Critical High: 90
Warning High: 85
Warning Low: 60
Critical Low: 55
Rearm: 2
Units: Fahrenheit
Reading Offset: 0

Buttons: Save, Reset

After the relay is setup you need to now setup your thresholds on your temp sensor in the sensor settings screen as shown above and Save them.

Sensor Settings
Temperature (Temperature2 Description) on Port 2

Settings **Relay Control** Siren Control Status Filter

This Sensor Controls the Relay on Port: 3 Relay3 Description
When the Sensor Goes: High Warning or High Critical, On
Cycle Time (secs): 3 3 secs
Buttons: Save, Reset

Next you need to link the temp sensor to your output relay, so you would first click on the Relay Control Tab. Note: As mentioned earlier this may appear different if your using the older unit. If this is the case you would click on the “Sensor Controlled Relay” button. You then choose the Relay that you previously setup from the “This Sensor Controls the Relay on Port” drop down list, choose the threshold for which you want to relay to be activated on and choose the action of the relay as shown in the screen shot above. You then would save this.

Summary	Sensors	Traps	Mail	Network	System
Auto refresh (sec.) 4 Stop	Online Status of Sensors				
Port	Type	Description	Reading	Status	Action
1	Humidity	Humidity1 Description	41 %	Normal	-
2	Temperature	Temperature1 Description	76 °F	Normal	-
3	Humidity	Humidity2 Description	65 %	Warning	-
4	Temperature	Temperature2 Description	88 °F	Warning	-
3	Relay	Relay3 Description	Yes	On	Ack
4	-	-	-	-	-
Sys Log (240 messages)					
1	08/09/00 05:27:14 Relay on RJ45#3 is now On				
2	08/09/00 05:27:13 Temperature sensor on RJ45#2 is 85 degrees F, status is now High Warning				
3	08/09/00 05:27:07 Humidity sensor on RJ45#2 is 63 %, status is now High Warning				

If we navigate back to the Summary page and force our temp sensor to be in the alert state we can now see that the temp sensor can turn on our output DCS15 dry contact relay.



This concludes the Dry Contact Sensor user manual.

Please contact support@akcp.com if you have any further technical questions or problems setting up your DCS15 or your alerts.

Thanks for Choosing AKCess Pro!